

the facts that (1) The undoubted specimens enumerated above, have all been taken where both species occur. (2) The ♂ genitalia are almost precisely alike in both species. (3) Sabine notes (*Proc. Sth. Lond. Ent. Soc.*, 1886, p. 61) that he once took a ♂ *A. thetis* in copulā with a ♀ *A. coridon*. (4) The chief (? only) foodplant of both species, in places where both occur, is *Hippocrepis comosa*. Now that the various blue races of *A. coridon* found in Asia Minor and Spain have been referred to the names originally given to them, and *polonus*, Zell., retained for the form that Zeller described, it would be interesting to learn whether any other examples than those noted above are to be found in any British or Continental collection.

Notes on *Melampias epiphron*, its habits and habitats in Cumberland.

By GEORGE WILKINSON.

Melampias epiphron is one of our characteristic Cumbrian insects, and for this reason it has always possessed a special interest for me, and these stray notes may, I hope, be found of interest to others. *Melampias epiphron* is essentially a mountain species, and, in Cumberland, is seldom taken at an elevation of less than 1500 feet. Below this height it may be taken rarely, and, on one occasion, I noticed an individual of this species as low as the foot of Green Gable, near the farm of Seathwaite; but the occurrence of specimens below the 1500 feet level, is probably due to their being blown down by strong winds. With regard to the special nature of its habitat, an erroneous impression seems to be prevalent. The general impression is that this species is partial to high-lying, marshy places. Stainton, in his "Manual" says, "always at a great elevation in marshy hollows on the mountain-sides;" and an entry in a MS. diary in my possession reads, "June 30th, 1888, *E. cassiope*, at the head of Teesdale, on marshy, peaty ground;" but my own observations do not confirm those just quoted, nor do they support the general impression that *M. epiphron* shows a preference for marshy ground. On several of our Cumbrian mountains it certainly does occur in marshy places, but it appears to have a stronger partiality for dry, stony places; for, in the latter localities, one can always find it in greater abundance. It is found in some numbers all around Styhead and Sprinkling Tarns, but it is much more abundant on the rough boulder-strewn ground, which surrounds the foot of Great End and Sprinkling Tarn, than on the more boggy ground about Styhead Tarn.

As regards the distribution of *M. epiphron* in Cumberland, it may be said to occur on all our Cumbrian mountains possessing the requisite elevation and suitable ground. Its headquarters are undoubtedly at the head of Honister Pass, and behind Honister Crag. On Dubs Moor, near the Drum-house—or Windlass-house—belonging to the Slate Quarries, the species abounds in company with *Nemeophila plantaginis* and *Crambus ericellus*. *M. epiphron* is not uncommon on Helvellyn, and all around Ambleside; it is very well-established on all sides of Scawfell, Great Gable, and the Haystacks; and the area of its distribution extends almost without a break from Grasmere on the east, to Ennerdale Water on the west. At Styhead and Honister at the end of June and throughout July, I have collected *M. epiphron* under the most diverse climatic conditions, and have been able to take specimens even on the wettest days. On wet, dull days,

it may be taken by opening and searching the tufts of grass which grow on the mountain sides; the number taken by this method averaging about ten in an hour. *M. epiphron* is on the wing as early as 6.40 a.m., and continues in flight until about 4.0 p.m.; there is a slight break about noon, and it appears to be most abundant between two and four in the afternoon. After the latter hour, the numbers seen in flight gradually decrease, and they can then be found at rest on the grass stems. As evening draws on, they make their way into the centres of the grass-tufts, and can then only be found, as on wet days, by opening and carefully searching the tufts of grass. On a fine, bright day, in suitable localities, one may be sure to find *M. epiphron* gently flitting to and fro like flakes of soot carried by the breeze; but sunshine is necessary to tempt the species take to flight. I have noted its habits on days with dull and bright intervals, and have found the insects during the dull periods sitting low amongst the herbage, very often on the flowers of *Tormentilla*, with wings widespread, waiting for the sun to break forth. As soon as they feel the influence of the sun's rays, they close and open their wings a few times before gently taking flight. To and fro they flit, generally about two feet above the ground. The flight is somewhat weak, and *M. epiphron* would be an easy insect to capture, but for the fact that there is generally a breeze blowing more or less strongly in the localities inhabited by the species, and the insect either permits, or cannot prevent, its being carried by the breeze, very often quite out of the range of sight.

It is generally between two and four in the afternoon, the favourite time of flight, when pairing takes place. Apparently the ♀ is not possessed of strong powers of attraction, for only once have I noticed more than one ♂ attracted by a "calling" ♀, and, in this instance, as soon as pairing was accomplished, the second ♂ settled within a few inches of the paired insects, and shewed no further interest. In the case of *M. epiphron*, the courtship is very simple, and is quite devoid of those aerial evolutions or other elaborate preliminaries exhibited by some species of *Ithopalocera*. The ♀, when "calling," sits low on a grass stem, and appears very much agitated, constantly moving her body, both in a lateral and vertical direction. As soon as the ♂ appears on the scene, he also exhibits much agitation, but, gently fluttering down, takes a few short flights from one blade of grass to another, and soon finds the ♀. Up to the point of actual contact, the ♀ has had its wings fully expanded, jerking them slightly at intervals, but, upon copulation taking place, it immediately folds them over its back. The insects appear to be very sluggish when paired, for several times I tried unsuccessfully to make a pair fly in the hope of finding out which sex would lead when they took flight.

It is by no means a difficult matter to induce the ♀ insect to deposit ova; in fact it is not at all unusual to find ova in one's collecting boxes after a collecting expedition, and, in this connection, I should like to record the fact of a number of ova being laid by an enclosed ♀ in a small glass-topped box between 9.30 p.m. and 6 a.m., on July 23rd-24th, 1907.

With a view to observing the ovipositing habits, I placed some ♀s which I took on July 21st, 1907, in a glass-sided cage containing a sod of grass, and placed the cage where it would receive the sun's rays. On July 22nd, only one ovum was noticed; on the 23rd, seven ova

were seen ; but on the 24th, about one hundred ova were counted. In the process of ovipositing, the ♀ usually alighted at the top of a blade of grass, which it gradually descended head downwards until it approached the base, when it would turn quickly upwards, attaching an egg near the roots, and usually well hidden from view. The ova were laid singly, and, only in two instances, did I find two ova in contact, but whether these were laid on separate occasions or not, I cannot state. The most remarkable feature about the ova was the variation in their size, some being quite twice as large as others. The ovum is about twice as long as it is broad, and is delicately ribbed longitudinally, with faint reddish spots showing between the ribs. The newly-laid ova were of a bright canary colour, but very gradually they became darker, until, by the third day, quite a perceptible change in coloration had been effected. On the seventh day some of the larger ova still retained their yellowish coloration, but the majority at this time were of a dull greyish colour, with a faint inclination to a reddish tinge. On August 8th the ova were of a dark greyish-blue colour. The following day it was possible to trace the outlines of the enclosed larvæ through the egg-shells, and, on August 10th, the larvæ commenced to emerge. The duration of the egg state was thus from eighteen to twenty-one days. The young larvæ invariably ate a small portion of the egg-shell whilst hatching, and the remaining egg-shell appeared quite transparent. To the naked eye, the newly-hatched larvæ seemed to be of a pale putty colour, the head appearing disproportionate on account of its being broader than the body. With the aid of a lens the colour and markings were more distinctly made out, and it was seen that the young larva was light grey in colour, with a dorsal line of a slightly darker grey, extending from the head to the last segment ; the spiracular line appeared very distinct on account of its being flanked on each side by a much lighter line ; there was a small black spot on each segment above the spiracular line, and on the face were two black spots. I posted the young larvæ to Mr. Alderson, who had been successful in rearing the insect from ova the previous year, but owing to an accident in transit, all the larvæ were dead on arrival.

Even in the breeding-cage, the larvæ are difficult to distinguish from their surroundings, but, in their natural habitat, it is a much more difficult matter to detect them, and the stunted nature of the grass renders it almost impossible to sweep for them. An all-night search for the larvæ upon the mountain sides is not a very enjoyable occupation for the entomologist, nor has it the compensation of being profitable. I have spent several nights upon our Cumbrian mountains working for lepidoptera, and would strongly advise anyone who intends working elevated ground after nightfall to select fairly level ground for this purpose, unless one is prepared to take the element of danger which is always present when working rough elevated ground in the darkness. I have very lively recollections of one of these nocturnal expeditions when, on a damp and misty night, I lost my bearings, and judged it prudent to squeeze myself in between two boulders, and there await the coming of dawn. When sufficient light came to enable me to distinguish my surroundings, my feelings can be imagined when I found myself on the verge of a precipitous face of

rock, down which I might have plunged through a single careless step.

In specimens of *M. epiphron* from Cumberland, a great range of variation is noticeable. I have seen specimens ranging from *ab. obsoleta*, Tutt, which is quite devoid of the usual fulvous band on the upperside, to a form in which the fulvous area is greatly extended. In a ♀ form which I now possess, nearly the whole area of the upper surface of its wings is suffused with fulvous, and the usual black spots are large and very distinct. I have also a specimen of which the fore- and hindwings on the left side are bleached, reminding one of the bleached aberrations of *Epinephele janira*. Typical *M. epiphron* are not commonly met with in Cumberland, the prevailing form being *ab. cassiope*, Fab., in which the black spots are devoid of white centres. Mr. Beadle, I believe, records the occurrence of the type in Cumberland, as being in the proportion of one in a hundred. The ♀ insect is generally slightly larger than the ♂, and its wings differ in shape in possessing a much more rounded outline than those of the ♂. Scotch specimens of *M. epiphron* are slightly larger than those from Cumberland, and the fulvous coloration appears of a brighter hue. I took a series of this species some years ago in Perthshire, on Ben Ledi, and what I saw of the insect in this particular locality, left me with the impression that Scotch *M. epiphron* vary quite as much as, or even more than, our Cumbrian specimens. Irish specimens I have not yet had the pleasure of seeing.

In the localities frequented by *M. epiphron*, one may usually meet with a few more interesting species to which it may not be out of place briefly to refer. *Nemeophila plantaginis* is usually common and variable, and *ab. hospita* is by no means uncommon. The larvæ of this species can be freely taken, and often a fair percentage of these produce *ab. hospita*. *Hadena contigua* is not uncommon, and may be found sitting on the rocks. In searching the faces of the rocks for the latter species during the daytime, one is almost certain to find *Cidaria salicata* sitting on the rocks; but it is not so easy to capture, as it flies off directly one approaches, and must be netted as it takes flight, for the nature of the ground is all in favour of the insect, and if once missed it seldom offers a second opportunity of capturing it. At dusk it can be found flying freely. Towards the latter part of June, *Crambus furcatellus* can be taken, and in July one can rely on finding specimens of *Crambus ericellus*. The latter flies freely from about 1.30 until 4.0 in the afternoon, while the former can probably be best taken from 7 a.m. until 9 a.m., when one can rely on finding it sitting on the tops of the grass-stems. Besides the species mentioned, several local micros are found more or less commonly resting on the rocks.

Diurni at Reazzino near Locarno.

By (REV.) F. E. LOWE, M.A., F.E.S.

Bellinzona being a convenient centre for various places of entomological interest, we stayed for a week at the Hotel de la Gare. I found myself too early for much success in excursions made to Monte Bré and the Upper Misox Valley, but at Reazzino, when weather permitted, had excellent sport. I spent some hours at the latter place each day